

# ONKYO SERVICE MANUAL

## STEREO CASSETTE TAPE DECK MODEL TA-2800

### Black model

UDN, UDC, UD	120V AC, 60Hz
UG	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQA, UQB	240V AC, 50Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

## SPECIFICATIONS

Track Format:	4-tracks, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.)
Wow and Flutter:	0.04% (WRMS)
Frequency Response:	20—17,000Hz (Normal) (30—16,000Hz $\pm$ 3dB) 20—18,000Hz (High) (30—17,000Hz $\pm$ 3dB) 15—21,000Hz (Metal) (20—20,000Hz $\pm$ 3dB)
S/N Ratio:	60dB (metal tape, Dolby NR off) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Line IN: 2 Input sensitivity: 60mV Input Impedance: 50kohms
Outputs:	Line OUT: 2 Standard output level: 1100mV (0dB) Optimum load impedance: over 50 kohms Headphone Jack: 1 Optimum load Impedance: 8 to 200 ohms
Motors:	DC servo motor: 1 DC motor: 2
Heads:	REC/PB: Special Hard Permalloy x 1; Erase head: Ferrite x 1
Power Supply Rating:	U.K. and Australian models: AC 240V, 50Hz U.S.A. and Canadian models: AC 120V, 60Hz Worldwide models: AC 120V and 220V switchable, 50 / 60Hz
Power Consumption:	24 watts
Dimensions:	435(W) x 132(H) x 366(D)mm (17-1/8" x 5-3/16" x 14-7/16")
Weight:	6.2 kg. (13.7 lbs.)

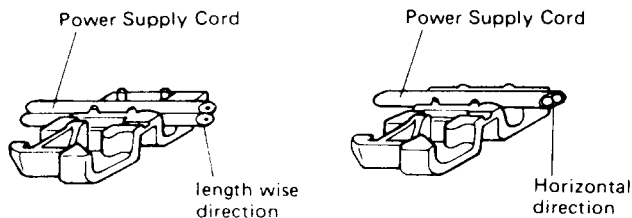
**ONKYO**  
AUDIO COMPONENTS

Specifications and external appearance are subject to change without notice because of product improvements.

## SERVICE PROCEDURES

### 1. Replacement of power supply cord

There are two power supply cord outlets on the strainrelief. Insert them in prescribed direction to ensure safety. AS-UC-3 (UD<120V> model) should be inserted lengthwise and other types of cords should be inserted horizontally.



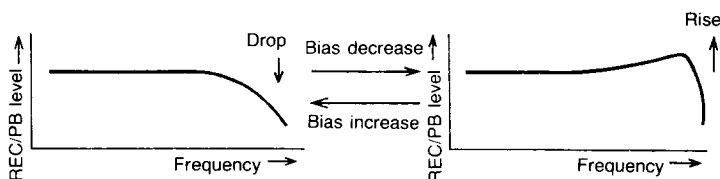
### 2. Insulating resistance measurement

Connect the insulating-resistance tester between the plug of power supply cord and chassis.  
Specifications: 500V more than 10MΩ

## HX PRO CIRCUIT OPERATION EXPLANATION

### 1. Regarding recording frequency characteristic and bias

Ordinarily, if the recording bias current is increased, REC/PB frequency response level in the high frequency region (about 10KHz and above) drops, and if the bias is decreased, the response rises.



### 2. Regarding the basic operation of HX PRO (Refer to Fig. 1)

The HX PRO uses the  $\mu$  PC1297CA IC. The operation is in accordance with the following.

- 1) At (a), the recording bias is added onto the audio signal, and the recording signal is detected. This is the same as the recording head recording the signal on the tape.
- 2) The signal of 1) preserves the frequency response with the integrated circuit of (b).

$$\text{Frequency} = \frac{R450 + R448}{2\pi \times C426 \times R450 \times R448} \quad (2.1)$$

By means of the frequency of Fig. 1, the frequency which is effective from the beginning is determined. In the ordinary situation, this is half the audio band (10KHz), (10KHz ~ 7.5KHz).

- 3) At (c), in order to use the affected waveform after-ward, absolute detection is carried out.

- 4) At (d), the waveform peak value is detected. The output becomes the peak DC voltage.
- 5) At (e), the standard voltage and the voltage of (4) are compared.
- 6) With the output of (e), the frequency generation level is controlled (voltage controlled amplifier). That is, the bias size is varied.
- 7) Summing up 1) ~ 6):

At (a), the time constant (frequency) that is detected in the recording signal is preserved, and above a certain frequency and above a certain level, the VCA controls the bias current by causing its reduction. When this is done, in the manner shown in the explanation of Item 1 above, the frequency high region is raised. With this control, the audio signal is instantaneously dealt with.

### 3. Regarding the operating conditions of the HX PRO

- 1) With equation (2. 1) noted above, the effect begins at the frequency thus determined.
- 2) Above a certain level the effect begins.  
(Substantially 0 dB: In the vicinity of 500mV line out)  
The audio signal component level is dependent upon the waveform after point (c).

HX PRO BLOCK DIAGRAM

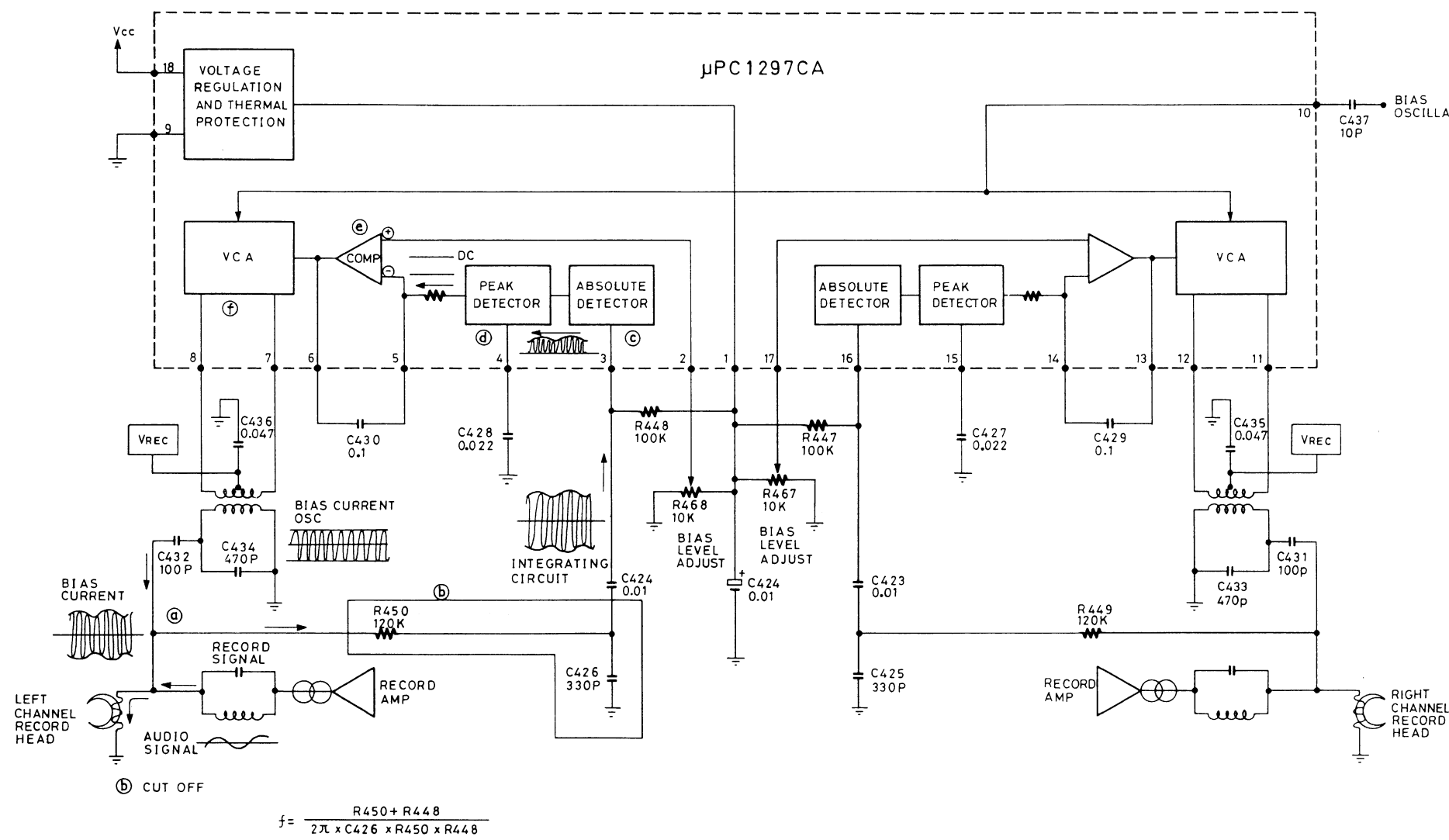
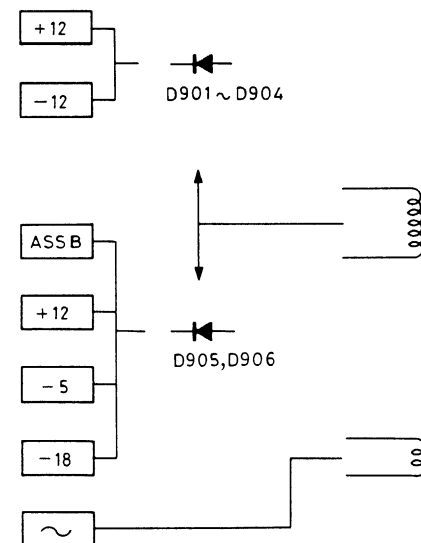
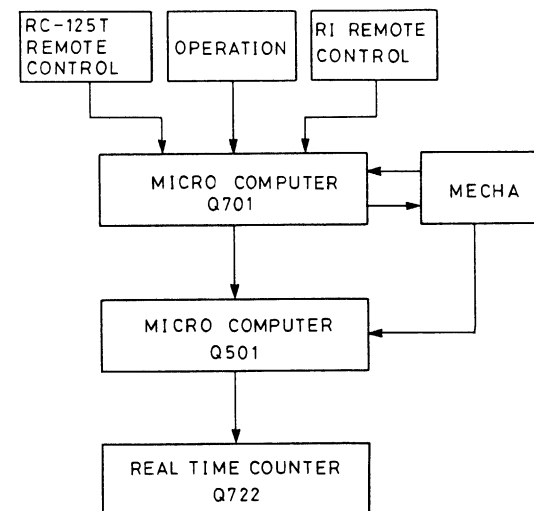
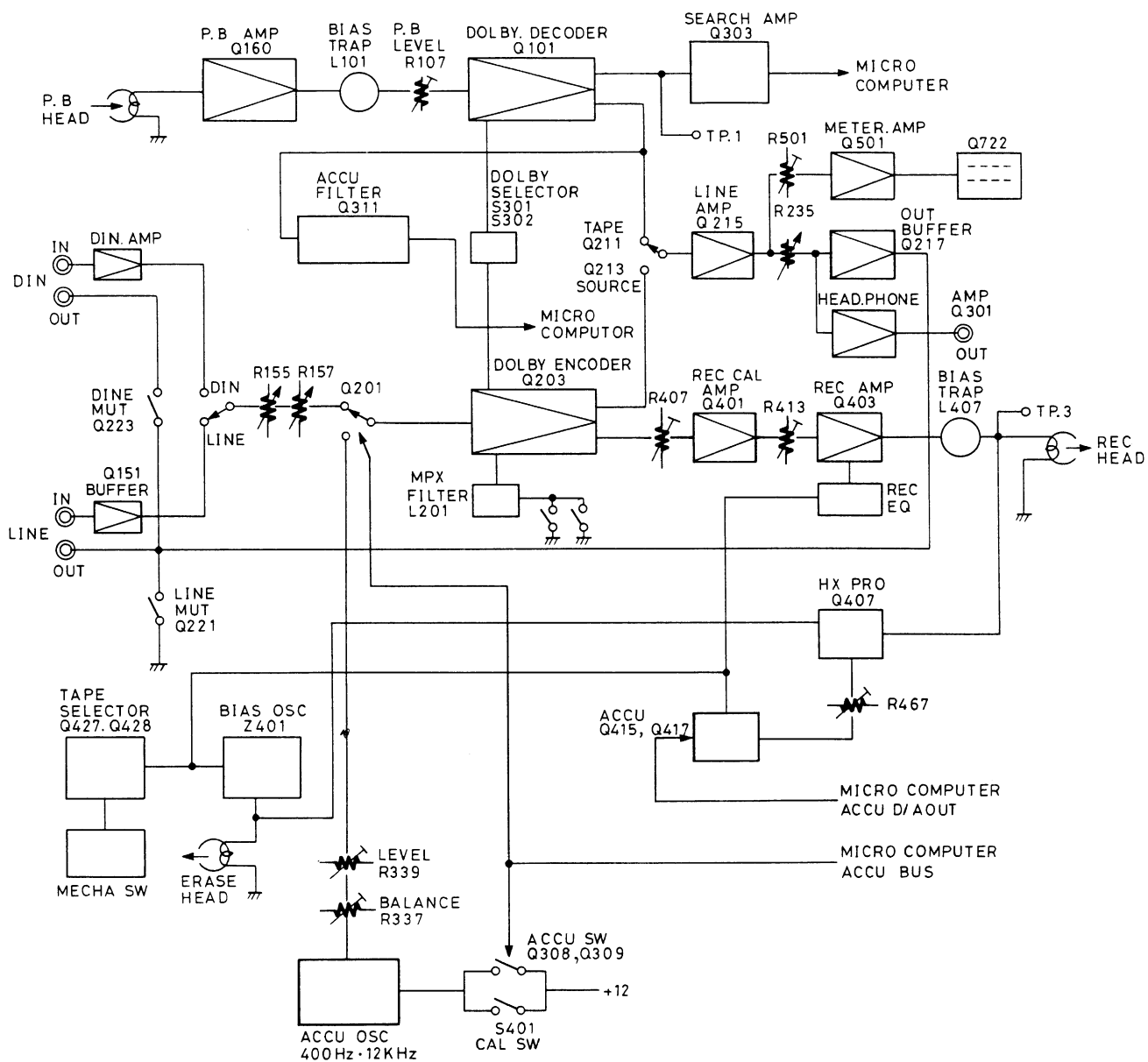
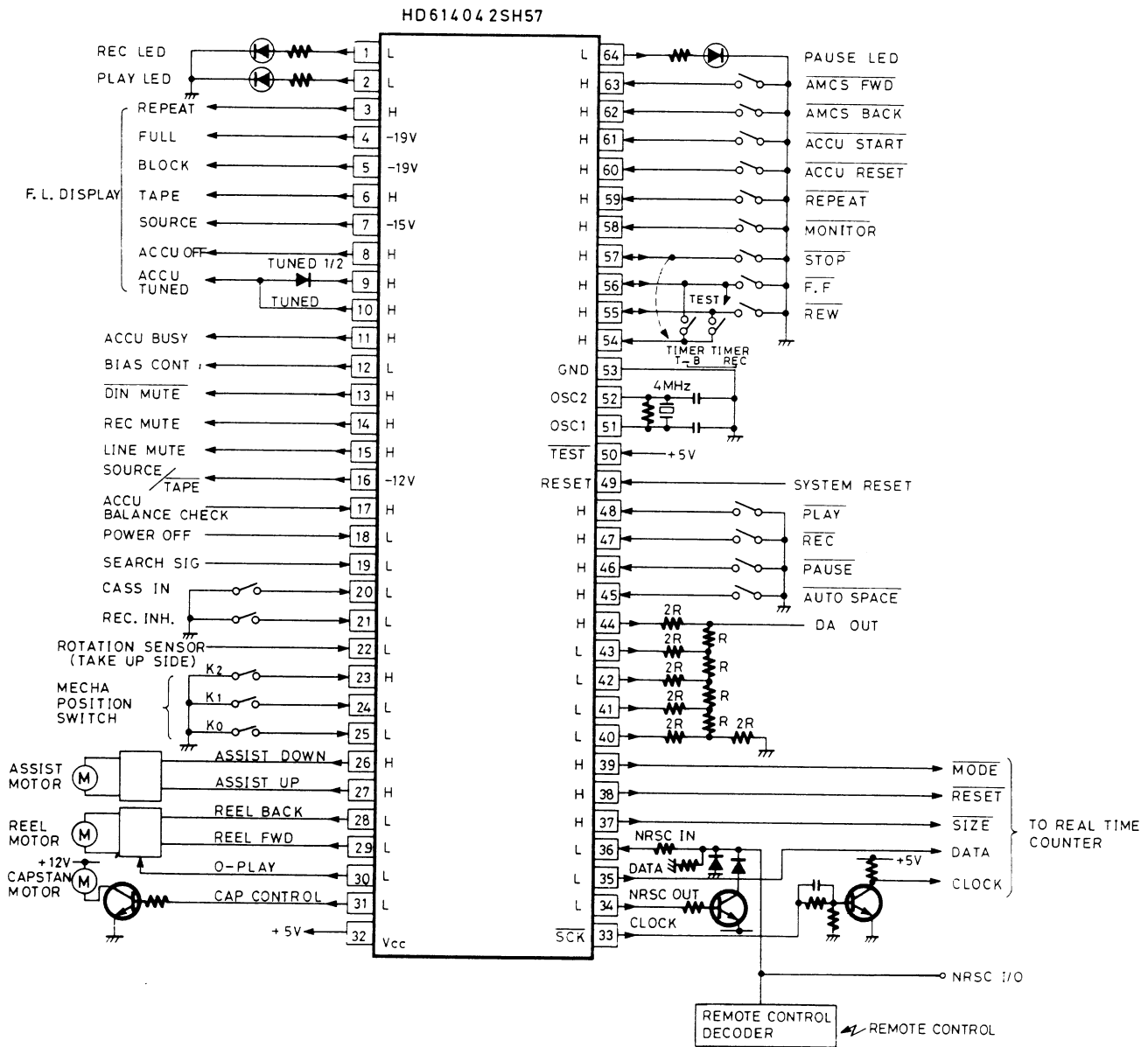


Fig. 1

## BLOCK DIAGRAM



# MICRO COMPUTER (HD614042SH57)

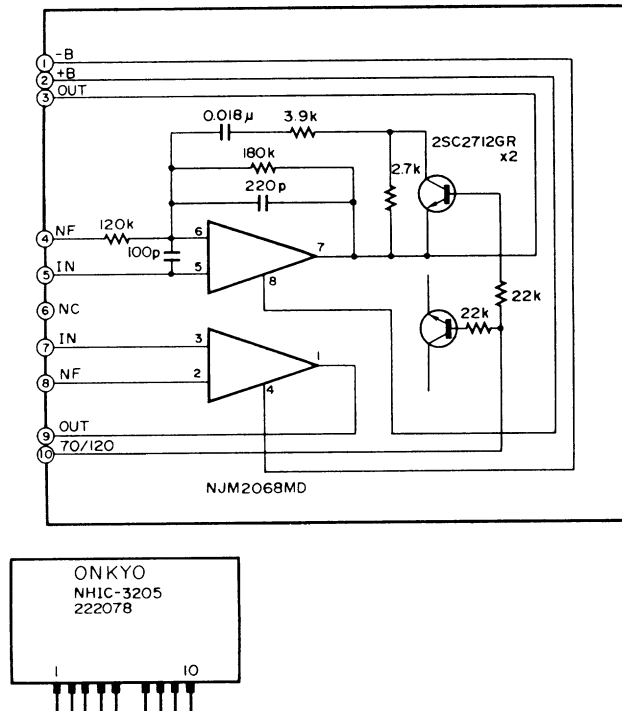


## MECHANICAL POSITION CODE

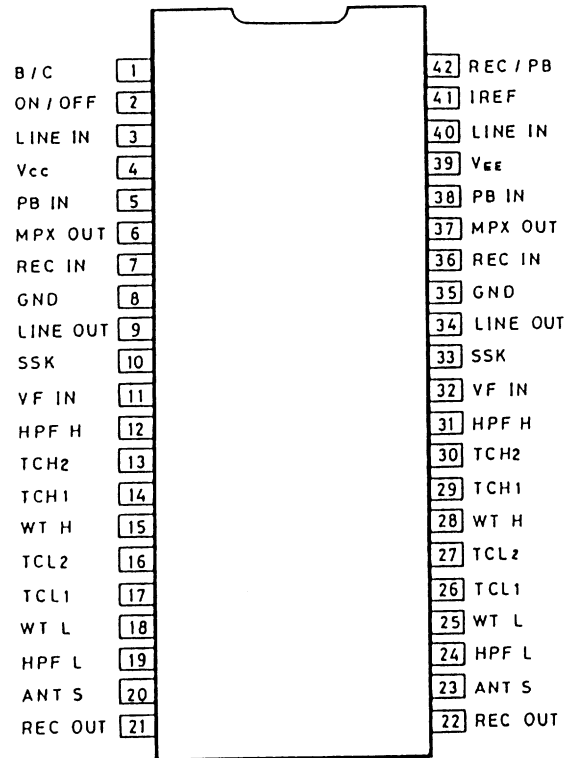
Q701 # 23	#24	#25	Mode
L	H	L	PLAY
L	L	H	PLAY → PAUSE
H	L	H	STOP
H	H	L	FF, REW

# IC BLOCK DIAGRAM

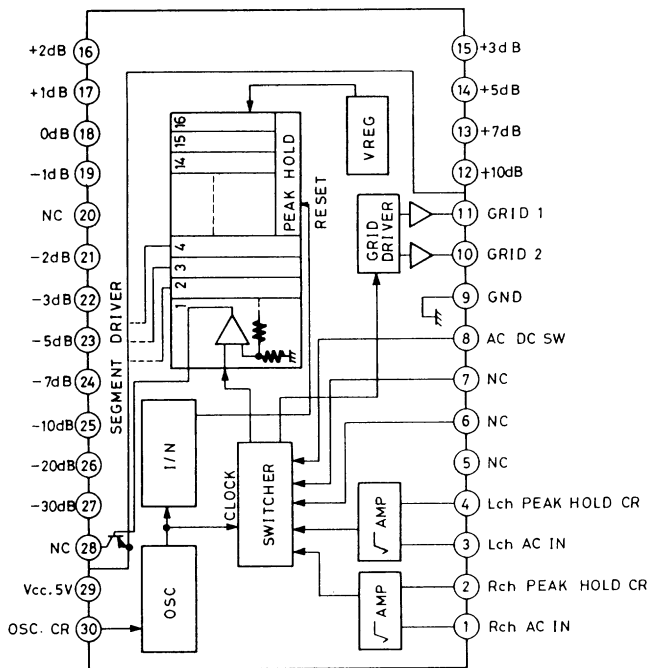
## NCHC-3205 (P.B. AMP)



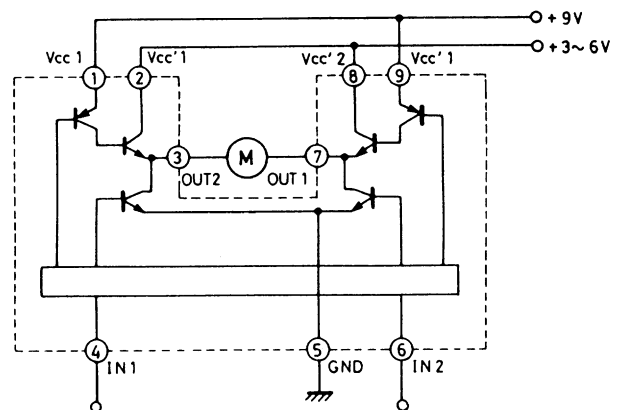
## CX20187 (DOLBY N.R)



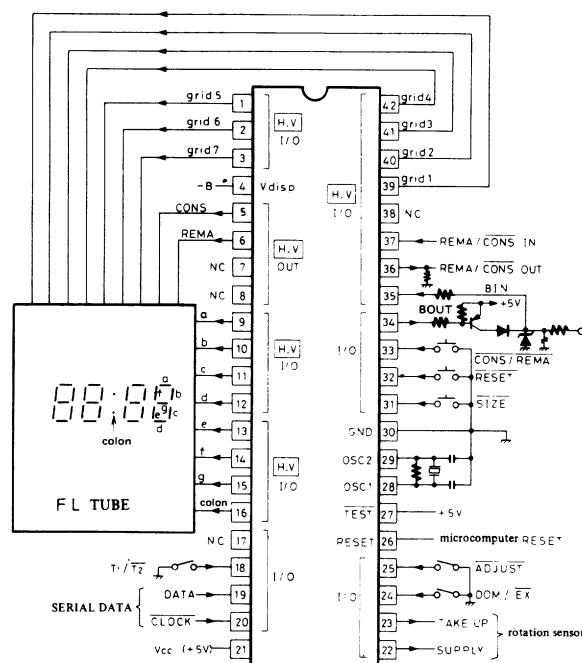
## BA6800AS (METER DRIVE)



## M54544AL (MOTOR DRIVE)



## HD614128SA41 (COUNTER)



## Terminal Name and Function

Pin No.	Name	Function
1 ~ 3	Grid 5 ~ 7	FL tube grid (DIGIT) drive use output
4	V <sub>disp</sub>	Input (FL tube use) for minus bias voltage to pin Nos. 1 ~ 3, 5, 6, 9 ~ 16, 39 ~ 42
5	CONS	FL tube <b>[CONS]</b> display use output (time lapse)
6	REMA	FL tube <b>[REMA]</b> display use output (time remaining)
9 ~ 15	a ~ g	FL tube segment drive use output
16	Colon	FL tube ":" drive use output
18	T <sub>1</sub> /T <sub>2</sub>	Microcomputer T <sub>1</sub> /T <sub>2</sub> function selection input (With T <sub>2</sub> , system I/O receiving)
19	DATA	Deck mechanism status input (8 bit serial data) from mechanism control micro-computer
20	CLOCK	Clock input for reading above DATA (DATA taken on pulse wave dropping)
21	Vcc	Microcomputer power source (+5V)
22	SUPPLY	Cassette mechanism tape feed side turning pulse input
23	TAKE UP	Cassette mechanism tape windup side turning (pulse input)
24	DOM/EX	Domestic/export setting use selector input (Tape size type selector use) Domestic: With power ON C46 → C54 → C60 → C80 → C90 → C120
25	ADJUST	Remaining time calculation buffer compensating value input (normally open, compensating ground)
26	RESET	Microcomputer system reset
27	TEST	Microcomputer internal test use port, normally connected to Vcc
28, 29	OSC1, OSC2	Microcomputer clock oscillator terminal
30	GND	Microcomputer power source (GND)
31	SIZE	Tape size selector input
32	RESET	Lapsed time reset input (When <b>[CONS]</b> displays, digits are □ : □ □)
33	CONS/REMA	Lapsed time ← → remaining time selector input (toggle display)
34	BOUT	System bus output
35	BIN	System bus input
36	REMA/CONS OUT	Remaining time display/lapsed time display status output (when T <sub>2</sub> )
37	REMA/CONS IN	Remaining time display/lapsed time display status input (when T <sub>2</sub> )
39 ~ 42	Grid 1 ~ 4	FL tube grid (DIGIT) drive use output

# ADJUSTMENT PROCEDURES

## PRECAUTIONS

- Before adjustment, clean the following parts with an alcohol moistened swab.
  - \* record/playback head
  - \* erase head
  - \* pinch roller
  - \* capstan
- Do not use magnetized screwdriver for adjustments.
- Demagnetize record/playback head with a head demagnetizer.

## TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator

Digital frequency counter

Oscilloscope

Attenuator

AC voltmeter

Non-magnetic screw driver

Test tapes

VTT-658 : 10 KHz, -15dB

MTT-111 : 3 kHz, -10dB

MTT-150 : Dolby level calibration  
400Hz, tone 200nWb/m

Item		Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the motor	3,005 to 3,010Hz	
2	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		VTT-658	PB	AC voltmeter	Head azimuth screw	Maximum and same phase at channels L and R	fig-1
3	Playback level	AC voltmeter to terminals TP-1 and TP-2		MTT-150	PB	AC voltmeter	R-107 (Ch.L) R-108 (Ch.R)	245mV	
4	Meter			MTT-150	PB	Level meter	R-501 (Ch.L) R-502 (Ch.R)	0dB	NADIS-3339
5	Bias trap	AC voltmeter to terminals TP-1 and TP-2		METAL TAPE	REC	AC voltmeter	L-101 (Ch.L) L-102 (Ch.R)	Minimum	
6	HX-PRO	AC voltmeter to terminals TP-3 and TP-4		METAL TAPE	REC	AC voltmeter	L-409 (Ch.L) L-410 (Ch.R)	Maximum	R-467 R-468 counter clock wise
7	Bias current	AC voltmeter to LINE output terminal	1kHz, -20dB and 12kHz, -20dB	NEW XL-II90	REC/PB	AC voltmeter	R-467 (Ch.L) R-468 (Ch.R)	Same level at REC/PB	Input VR maximum
8	Record level	fig-2	1kHz		REC	AC voltmeter	Attenuator or AF OSC output	350mV	Input VR maximum
					REC/PB	AC voltmeter	R-413 (Ch.L) R-414 (Ch.R)	Same level at REC/PB	
9	ACCU OSC signal	Oscilloscope to TP-5 (NCAF-3344)				Oscilloscope	R-337 (NCAF-3344)	Same level at 400Hz/ 12kHz fig-3	REC CAL SW ON
							R-339 (NCAF-3344)	30mVpp fig-3	

PLAY torque ..... 35~70g/cm

FF. REW torque ..... 70g/cm

Back tension ..... 6~10g/cm

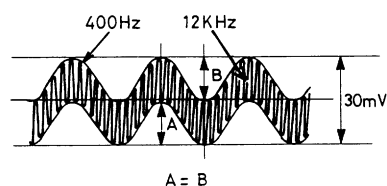
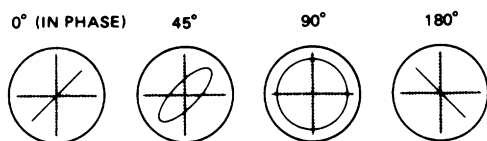
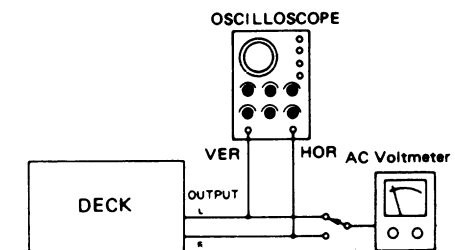
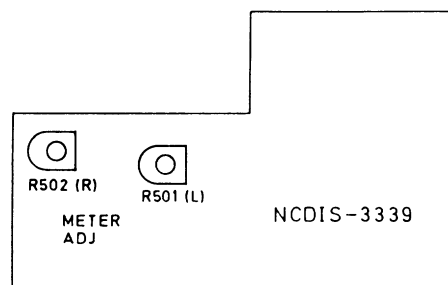
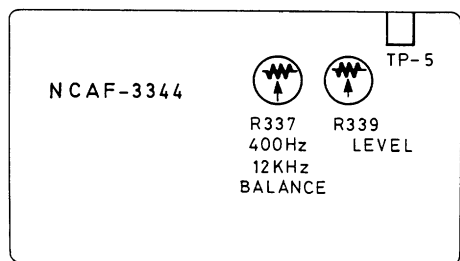
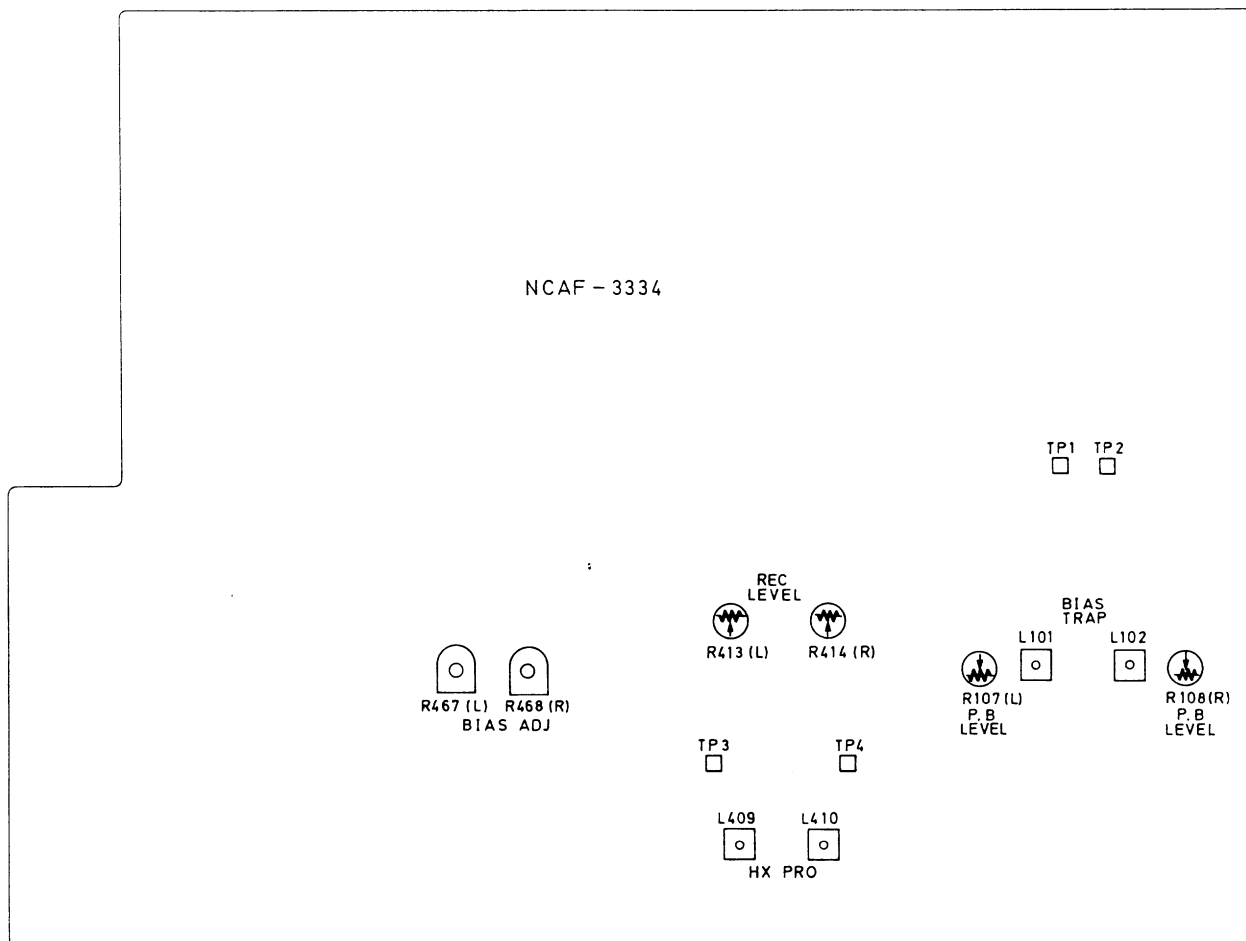


fig-3





Confirming phase relationship

fig-1

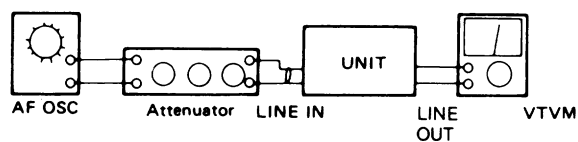




fig-2




# CHASSIS-EXPLODED VIEW PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
A1	27110430C	FRONT BRACKET AS
A4	27141273	BRACKET (PC)
A5	28133200	BACK PLATE <b>CRO33</b>
A6	27130536A	BRACKET (PT)
A7	27130541A	BRACKET (VOL)
A8	27273069A	JOINT (POW)
A9	27190524	HOLDER
A11	27121146A	BACK PANEL (D)
	27121147	BACK PANEL (G)
	27121148	BACK PANEL (W)
	27121181	BACK PANEL (Q)
A12	27100164B	CHASSIS
A14	834430088	TAP-TIGHT SCREW 3TTS+8B(BC)
A15	831130088	TAP-TIGHT SCREW 3TTW+8B
A16	830440109	TAP-TIGHT SCREW 4TTC+10C(BC)
A18	838426088	TAP-TIGHT SCREW 2.6TTB+8B
A19	27300750	BUSHING (CORD)
A20	28140877	CUSHION
A21	28140881	CUSHION
A24	27141284	BRACKET(ST)
A25	880009	NRP-345,RIVET
A26	27270272	SPACER
A301	28184397	TOP COVER
A302	838440089	TAP-TIGHT SCREW 4TTB+8C(BC)
A304	28140408	CUSHION
A314	28191469	CLEAR PLATE
A318	27301123A	CASSETTE LID
A319	27301122	CASSETTE LID (AL)
A320	28400413	WINDOW
A321	28135156	BADGE
A322	833430080	TAP-TIGHT SCREW 3TTP+8P(BC)
A323	834230108	TAP-TIGHT SCREW 3TTS+10B(Ni)
A330	27175153	LEG
A501	1N049121	FRONT PANEL ASS'Y
-a	28125194-1	END CAP (L)
-b	28125195-1	END CAP (R)
-c	27267555	GUIDE (VOL)
-d	28194297	COSMETIC BAR
-e	27267481B	GUIDE (POW)
-f	28198670	FACET (POW)
-g	28191475	CLEAR PLATE (RE)
A801	28323388A	KNOB (PUSH)
A803	28323389	KNOB (BAL)
A804	28323410	KNOB (SEL)
A806	28323287	KNOB (EJECT)
A807	27260279	SHAFT (EJ)
A808	28323395	KNOB (LEV)
A810	28323175	KNOB (POW)
P901	253112A	AC CORD AS-UC-4 (D)(PX)
	253149	AC CORD AS-CEE (G/W)
	253104	AC CORD C2.5BS2 (Q)

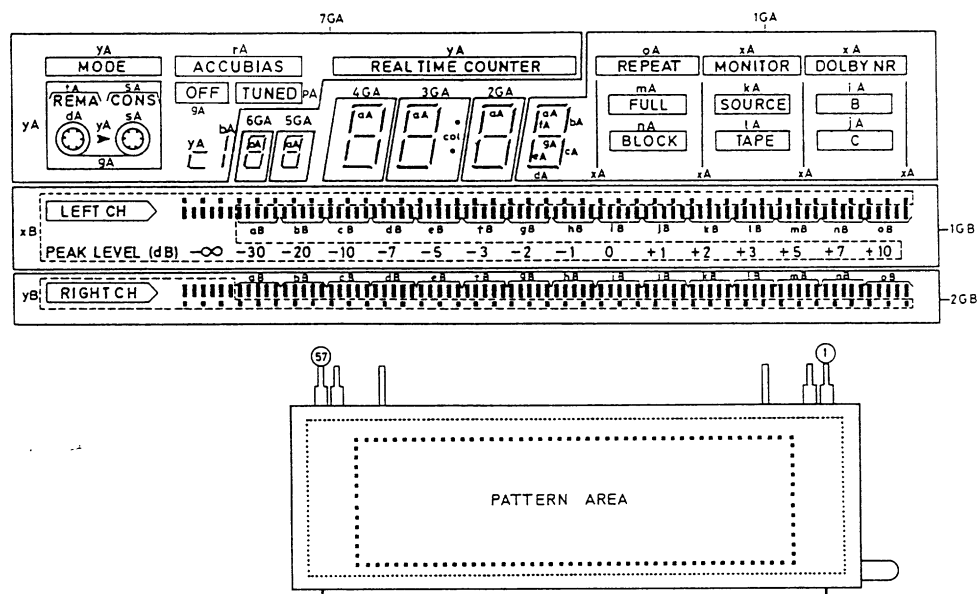
REF.NO.	PART NO.	DESCRIPTION
 S902	25065123	NSS-1258P (W)
 T901	2300335	NPT-1003D (D)
	2300336	NPT-1003G (G)
	2300337	NPT-1003DG (W)
	2300359	NPT-1003Q (Q)
U1	1N048534-2	NAAF-3334-2 (D/W/Q)
	1N048534-2A	NAAF-3334-2A (G)
U2	1N048536-2	NADIS-3336-2
U3	1N048537-2	NASW-3337-2
U4	1N048538-2	NAETC-3338-2
U5	1N048539-2	NADIS-3339-2
U6	1N048540-2	NAAF-3340-2
U7	1N048545-2	NAAF-3345-1
U8	1N048542-1	NASW-3342-2
U9	1N048543-2	NASW-3343-2
U10	1N048544-2	NAAF-3344-1
Z1	244116	NDM-108, CASSETTE DECK MECHANISM

NOTE:

<D>:Only 120V model  
 <G>:Only 220V model  
 <W>:Only Worldwide model  
 <Q>:Only 240V model  
 <PX>:Only P. X. model

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

BG-555G (DISPLAY TUBE)



PIN CONNECTION

PIN NO.	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	nB	oB	yB	xB	2GB	1GB	NB	NB	tA	sA	yA	7GA	6GA	5GA	4GA	3GA	2GA	hA	gA	fA	eA	dA	cA	bA	aA	1GA	xA	rA	qA	pA	oA	nA	mA	lA	kA	JA	IA	NB	FB	FB

PIN NO.	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
CONNECTION	F2	F2	NB	NB	aB	bB	cB	dB	eB	fB	gB	hB	iB	jB	kB	lB	mB

	<b>Resistor</b>	
R501, R502	5215020	NO8HR5KBC
R509	49163104415	100k×15, 1/10W

	<b>Socket, plug</b>	
P501A	2000879	NSAS-8P835
P703	25055226	NPLG-4P210
P705A	2000757	NSAS-10P713
P706A	2000649	NSAS-10P605
P707	25055225	NPLG-3P209
P708A	2000884	NSAS-14P840

	<b>Bracket</b>	
	27130539A	BRACKET(FL)

**NAAF-3340-2****CIRCUIT NO. PART NO. DESCRIPTION**

	<b>Transistor</b>	
Q409-Q414	2211255 or 2210746	2SC1815GR or 2SC945A-P

	<b>Coil</b>	
L401, L402	233194 or 231089	NCH-1039 or NCH-2137
L403, L404	24606069 or 231084	NCH-1007 or NCH-2132
L405, L406	24606080 or 231083	NCH-1022 or NCH-2131

	<b>Plug</b>	
P403	25055317	NPLG-3P300
P404	25055319	NPLG-5P302

**NAAF-3345-1****CIRCUIT NO. PART NO. DESCRIPTION**

Q750	24130001	GP1U501S
Q751	221281	DTC114YS
D311	225137CG, 225137DG or 225137DY	SEL2413CG, SEL2413DG or SEL2413DY

	<b>Resistor</b>	
R155	5104239	N12RGLC5KMN25Z
R157	5104241	N16RGL5KA25Z
R235	5104238	N12RGL5KA25Z
R407, R408	5104240	N12RGLC5KB25Z

	<b>Switch</b>	
S301-S303	25035514	NPS-122-L476, PUSH
S401	25035515	NPS-142-L477, PUSH

	<b>Socket</b>	
P107A	2000877A	NSAS-6P833
P108A	2000876A	NSAS-6P832
P201A	2000886	NSAS-12P842
P307A	2000776	NSAS-10P732
P401A	2000887	NSAS-12P843
P402A	2000885	NSAS-10P841
P707A	2000875	NSAS-6P831
P711A	2000490	NSAS-6P446

	<b>Holder</b>	
	27190650	HOLDER(LED)

**NASW-3342-2****CIRCUIT NO. PART NO. DESCRIPTION**

	<b>LED</b>	
D708, D709	225141	SEL2213C
D710	225137CG, 225137DG or 225137DY	SEL2413CG, SEL2413DG or SEL2413DY

	<b>Switch</b>	
S701-S710	25035548	NPS-111-S510, PUSH
S712-S717	25035548	NPS-111-S510, PUSH

	<b>Socket</b>	
P701A	2000883	NSAS-18P839
P702A	2000818	NSAS-14P774
P703A	2000665	NSAS-8P621
P704A	2000571	NSAS-8P527

	<b>Holder</b>	
	27190649	HOLDER(LED3)

**NASW-3343-2****CIRCUIT NO. PART NO. DESCRIPTION**

C901	3500065A	0.01 $\mu$ , AC400V, CAPACITOR IS.
S901	25035558 25060092	NPS-111-L520P, PUSH NMT-1S33, TERMINAL

**NASF-3344-1****CIRCUIT NO. PART NO. DESCRIPTION**

	<b>lc</b>	
Q311	222681 or 22240040	IR3702 or NJM2902N

	<b>Transistor</b>	
Q306, Q307	2211255 or 2210746	2SC1815GR or 2SC945A-P
Q321	2211255 or 2210746	2SC1815GR or 2SC945A-P

	<b>Diode</b>	
D304-D307	223132	1K60
D308	223163	1SS133
D309	224450511, 224150511 or 224650511	MTZ5.1B, 05AZ5.1Y or HZ5.1EB2

	<b>Capacitor</b>	
C310	354780339	3.3 $\mu$ F50V, ELECT.
C311	354741009	10 $\mu$ F16V, ELECT.
C315-317	354741009.	10 $\mu$ F16V, ELCT.
C320	354780479	4.7 $\mu$ F50V, ELECT.
C321	354742209	22 $\mu$ F16V, ELECT.
C324	354784799	0.47 $\mu$ F50V, ELECT.
C325	354741009	10 $\mu$ F16V, ELECT.

	<b>Resistor</b>	
R337	5215036	N08HR100KBA
R339	5215031	N08HR1KBA

	<b>Plug</b>	
P305	25055318	NPLG-4P301
P306	25055319	NPLG-5P302

NOTE (G): Only 220V model

# PC BOARD PARTS LIST

## NAAF-3334-2

### CIRCUIT NO. PART NO. DESCRIPTION

Ics		
Q101	222999	CX-20187
Q151	222502	NJM-4558DX
Q160	222078	NHIC-3205
Q201	222840661 or	4066B or
	222933	BU-4066B
Q203	222999	CX-20187
Q215	222502	NJM-4558DX
Q217	222921 or	BA4558 or
	222465	NJM-4558D
Q301	22240111 or	BA15218 or
	222808	M5218P
Q303	222940	BA335H
Q401	222502	NJM-4558DX
Q403	22240111 or	BA15218 or
	222808	M5218P
Q407	222959	μPC1297CA
Q415, Q417	222921 or	BA4558 or
	222465	NJM-4558D
Q701	<u>22240169</u>	HD614042SH57
Q702	22240156	LC6527H-3659
Q706, Q709	222953	M-54544AL
Q901, Q902	222780125MIT	78M12
Q906	222780055MIT	78M05
Transistors		
Q103	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q104	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q153, Q154	2211406 or	2SC2240-BL or (G)
	2211896	2SC1815LL
Q155, Q156	2211455 or	2SA1015-GR or (G)
	2212495	JA101Q
Q205-Q209	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q210	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q211-Q214	2212304 or	2SK381-D or
	2211945	2SK246-GR
Q219, Q220	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q221, Q222	2211706	2SD655-F
Q223, Q224	2212304 or	2SK381-D or (G)
	2211945	2SK246-GR
Q225, Q226	221281	DTC114YS
Q227	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q304	221282	DTC144ES
Q305	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q308	2213090	DTA114YS
Q309	221282	DTC144ES
Q315	221282	DTC144ES
Q405, Q406	2212794 or	2SD1468-R or
	2212795	2SD1468-S
Q419-Q421	221282	DTC144ES
Q422	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q423, Q424	221282	DTC144ES
Q425	2201540	2SD947
Q426-Q428	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q703	2213090	DTA114YS
Q704	221281	DTC114YS
Q705	2201385	2SD330-E

Q707	221281	DTC114YS
Q708	2201540	2SD947
Q710	2201540	2SD947
Q711	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q712	2213090	DTA114YS
Q713	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q714	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q715	221282	DTC144ES
Q716	2211255 or	2SC1815-GR or
	2210746	2SC945-AP
Q717	221282	DTC144ES
Q718	2213090	DTA114YS
Q903	2211455 or	2SA1015-GR or
	2212495	JA101Q
Q904	2201924 or	2SD1761-E or
	2201385	2SD330-E
Q905	2211255 or	2SC1815-GR or
	2210746	2SC945-AP

Diodes		
D101, D102	224450822,	MTZ8.2B,
	224150822 or	05AZ8.2Y or
	224650822	HZ8.2EB2
D151-D154	223163	1SS133
D201, D202	224450822,	MTZ8.2B,
	224150822 or	05AZ8.2Y or
	224650822	HZ8.2EB2
D205, D206	223163	1SS133 (G)
D207-D211	223163	1SS133
D301, D302	223163	1SS133
D310	223163	1SS133
D401	223163	1SS133
D404-D409	223163	1SS133
D701	224451002,	MTZ10B,
	224151002 or	05AZ10Y or
	224651002	HZ10EB2
D702	224451003,	MTZ10C,
	224151003 or	05AZ10Z or
	224651003	HZ10EB3
D703	224450562,	MTZ5.6B,
	224150562 or	05AZ5.6Y or
	224650562	HZ-5.6E-B2
D704-D707	223163	1SS133
D901-D906	22380006 or	1N4003 or
	223894	1N4002F
D907	224452001,	MTZ20A,
	224152001 or	05AZ20X or
	224652001	HZ20EB1
D908	224450511,	MTZ5.1A,
	224150511 or	05AZ5.1X or
	224650511	HZ5.1EB1
D909	22380006 or	1N4003 or
	223894	1N4002F
D910	224451501,	MTZ15A,
	224151501 or	05AZ15X or
	224651501	HZ15EB1
D911, D912	223163	1SS133

Coils		
L101, L102	231147	NCH-4199
L103, L104	233382	NMC-2069
L201, L202	233328	NMC-6051
L203, L204	233382	NMC-2069
L407, L408	231101	NCH-2148
L409, L410	231100	NCH-4147
L411, L412	231077	NCH-2125

OSC Block		
Z401	231149	NOB-038

<b>Ceramic OSC</b>		
X701	3010099 or 3010128	CSA-4.00MG or PRS-4.00RM11
<b>Capacitors</b>		
C103, C104	354722219	220 $\mu$ F6.3V, ELECT.
C105, C106	354741009	10 $\mu$ F16V, ELECT.
C107, C108	354741009	10 $\mu$ F16V, ELECT.
C115, C116	354744719	470 $\mu$ F16V, ELECT.
C139, C140	354741009	10 $\mu$ F16V, ELECT.
C141, C142	354741019	100 $\mu$ F16V, ELECT.
C143, C144	354742219	220 $\mu$ F16V, ELECT.
C147	354742209	22 $\mu$ F16V, ELECT.
C151, C152	392880107	1 $\mu$ F50V, LL.
C153, C154	392880107	1 $\mu$ F50V, LL. (G)
C155, C156	354782299	0.22 $\mu$ F50V, ELECT. (G)
C157, C158	354741019	100 $\mu$ F16V, ELECT. (G)
C163, C164	354780479	4.7 $\mu$ F50V, ELECT.
C201, C202	354780479	4.7 $\mu$ F50V, ELECT.
C203, C204	352950476	4.7 $\mu$ F25V, NP.
C229, C230	354741009	10 $\mu$ F16V, ELECT.
C231, C232	354741009	10 $\mu$ F16V, ELECT.
C233, C234	354741019	100 $\mu$ F16V, ELECT.
C235, C236	354742219	220 $\mu$ F16V, ELECT.
C237	354780479	4.7 $\mu$ F50V, ELECT.
C241, C242	354741009	10 $\mu$ F16V, ELECT.
C245	354780229	2.2 $\mu$ F50V, ELECT.
C246	354744709	47 $\mu$ F16V, ELECT.
C247, C248	354780479	4.7 $\mu$ F50V, ELECT.
C249	354741009	10 $\mu$ F16V, ELECT.
C251, C252	354741009	10 $\mu$ F16V, ELECT.
C301, C302	354741009	10 $\mu$ F16V, ELECT.
C303	354780229	2.2 $\mu$ F50V, ELECT.
C305	354782299	0.22 $\mu$ F50V, ELECT.
C306	354784799	0.47 $\mu$ F50V, ELECT.
C327	354780479	4.7 $\mu$ F50V, ELECT.
C328	354741009	10 $\mu$ F16V, ELECT.
C401, C402	354741009	10 $\mu$ F16V, ELECT.
C403, C404	354780479	4.7 $\mu$ F50V, ELECT.
C405, C406	354782299	0.22 $\mu$ F50V, ELECT.
C407, C408	354780479	4.7 $\mu$ F50V, ELECT.
C431, C432	370131014S	100PF 100V, APS
C433, C434	370134714S	470PF 100V, APS
C438, C439	354741009	10 $\mu$ F16V, ELECT.
C440, C441	354722219S	220 $\mu$ F3.6V, ELECT.
C442-C444	354780479	4.7 $\mu$ F50V, ELECT.
C708	354780479	4.7 $\mu$ F50V, ELECT.
C712	354784799	0.47 $\mu$ F50V, ELECT.
C716	354741009	10 $\mu$ F16V, ELECT.
C902, C903	354752229S	2200 $\mu$ F25V, ELECT.
C904, C905	354784799	0.47 $\mu$ F50V, ELECT.
C906, C907	354780479	4.7 $\mu$ F50V, ELECT.
C908	354751029S	1000 $\mu$ F25V, ELECT.
C909	354741019	100 $\mu$ F16V, ELECT.
C910	354744709	47 $\mu$ F16V, ELECT.
C911	3504168	13000 $\mu$ F25V, ELECT.
C912, C913	354784799	0.47 $\mu$ F50V, ELECT.
C914	354780479	4.7 $\mu$ F50V, ELECT.
<b>Resistors</b>		
R107, R108	5210062	N06HR 4.7KBD
R413, R414	5210062	N06HR 4.7KBD
R467, R468	5215045 or 5215021	N08HR 10KBC or N08HR 10KBC
R473	442525604	RS1/2WBJ 56 $\Omega$
R476	442525604	RS1/2WBJ 56 $\Omega$
R704	49163104407	100k $\Omega$ $\times$ 7, 1/10W, NETWORK
R707	49163392405	3.9k $\Omega$ $\times$ 5, 1/10W, NETWORK
R710	441722704	RS 2 WBJ 27 $\Omega$
R737	49163392407	3.9k $\Omega$ $\times$ 7, 1/10W, NETWORK
R738	49163392409	3.9k $\Omega$ $\times$ 9, 1/10W, NETWORK
R903, R904	442522294	RS1/2WBJ 0.22 $\Omega$

R905	442520224	RS1/2WBJ 2.2 $\Omega$
R908	441724704	RS 2 WBJ 47 $\Omega$
R909	442520104	RS1/2WBJ 1.0 $\Omega$

<b>Plug</b>		
P101	25055134	NPLG-4P118
P103	25045208	NPJ-4PDBL88
P105	25050064	NSCT-5P18, DIN SOCKET (G)
P107, P108	25055147	NPLG-3P131
P201L, P201R	25055147	NPLG-3P131
P303A	2000878	NSAS-6P834, SOCKET
P307	25055186	NPLG-5P170
P401L, P401R	25055147	NPLG-3P131
P402	25055186	NPLG-5P170
P405	25055134	NPLG-4P118
P407	25055132	NPLG-2P116
P501L, P502R	25055146	NPLG-2P130
P701	25055190	NPLG-9P174
P702	25055188	NPLG-7P172
P704	25055185	NPLG-4P169
P705, P706	25055149	NPLG-5P133
P708	25055151	NPLG-7P135
P709	25055139	NPLG-9P123
P710	25055140	NPLG-10P124
P711	25055184	NPLG-3P168
P712	25045172	HSJ-1003-01-020

**Miscellaneous**

27160211-1	RAD-68B, RADIATOR
27160227	RAD-076, RADIATOR
27160211	RAD-68, RADIATOR
82143006	3P+6FN(BC), SCREW

**NADIS-3336-2**

CIRCUIT NO.	PART NO.	DESCRIPTION
D913, D914	225142	SEL2913K, LED
	27190499A	HOLDER(LED), POW

**NASW-3337-2**

CIRCUIT NO.	PART NO.	DESCRIPTION
S721	25030305	NRS-123-15MP, TIMER SWITCH

**NAETC-3338-2**

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	25045139	HLJ0504-01-010

**NADIS-3339-2**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Ic</b>		
Q501	22240170	BA6800AS
Q720	22240084	HD614128SA41

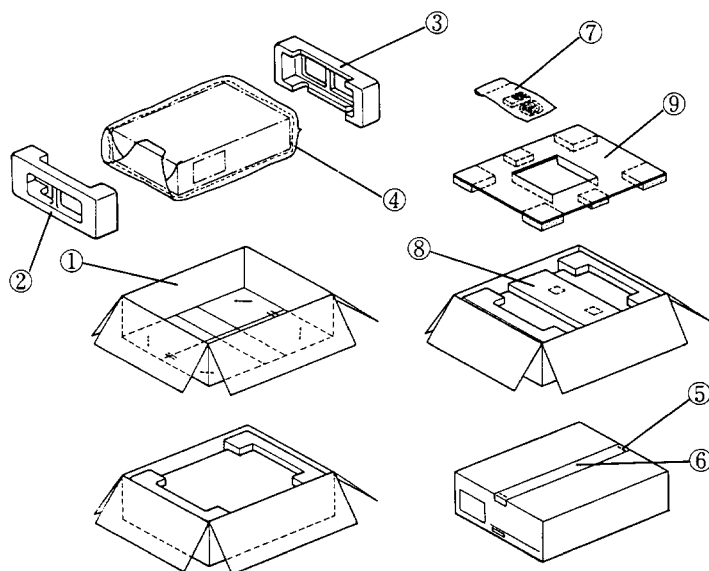
<b>Display tube</b>		
Q722	212057	BG-545G

<b>Transistor</b>		
Q503, Q504	2213090	DTA114YS
Q723, Q724	2211255 or 2210746	2SC1815GR or 2SC945A-P

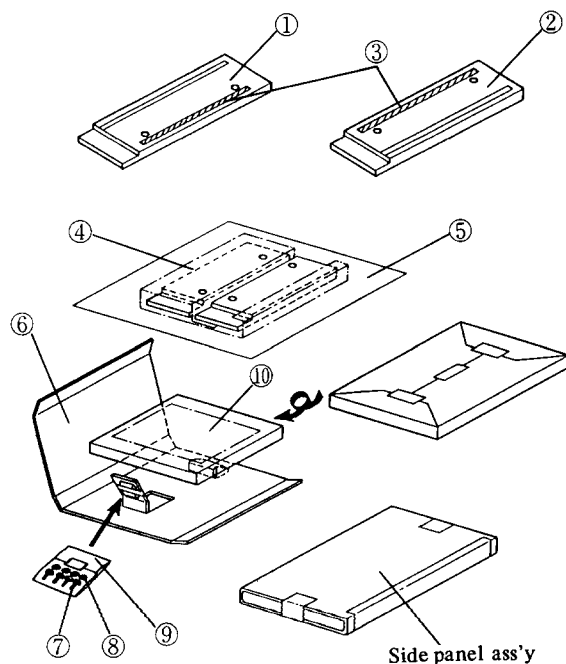
<b>Ceramic OSC</b>		
X702	3010118 or 3010129	CSA3.00MG or PRS-3.00RM03

<b>Capacitor</b>		
C501, C502	354741009	10 $\mu$ F16V, ELECT.
C503, C504	354742209	22 $\mu$ F16V, ELECT.
C720	354741009	10 $\mu$ F16V, ELECT.

# PACKING VIEW



Only P.X. model



## D MODEL

REF.NO.	PART NO.	DESCRIPTION
1	29051727	Master carton box
	29051751A	Master carton box (PX)
2	29091264A	Pad (L)
3	29091265A	Pad (R)
4	29100105	550×680 Poly bag
	29095012-1	500×800 Protection sheet (PX)
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessory bag ass'y	
	29341290	Instruction manual
	2010098A	Connection cable
	29365019	Warranty card (N)
	29358002F	Service station list (N)
	25055251	Conversion plug (CV-CP) (PX)
	29100006A	350×250 Poly bag
	24140027	Remote control unit
	3010124	Battery UM-4
8	28185315-1	Side panel ass'y (PX)
9	29091298	Pad (PX)

## G/W MODEL

REF.NO.	PART NO.	DESCRIPTION
1	29051727	Master carton box
	29051751A	Master carton box (PX)
2	29091264A	Pad (L)
3	29091265A	Pad (R)
4	29100105	550×680 Poly bag
	29095012-1	500×800 Protection sheet (PX)
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessory bag ass'y	
	29341289	Instruction manual
	29341292	Instruction manual (I)
	29365021	Warranty card (PX)
	29365022	Warranty card (QB)
	2010095	Connection cable
	25055018	Conversion plug (CV-K-2) (W)
	25055251	Conversion plug (CV-CP) (PX)
	29100006A	350×250 Poly bag
	24140027	Remote control unit
	3010124	Battery UM-4
8	28185315-1	Side panel ass'y (PX)
9	29091298	Pad (PX)

## PX MODEL




REF.NO.	PART NO.	DESCRIPTION
1	28185344	Side panel (L)
2	28185345	Side panel (R)
3	28140887	Cushion
4	29095539	Protection sheet
5	29095039-1	Protection sheet
6	29051732	Carton box
7	836440303	4STV+30CQ (BC) Screw
8	870086	4×12BS (BC) Washer
9	29100026	150×80 Poly bag
10	29341018-1	Instruction manual

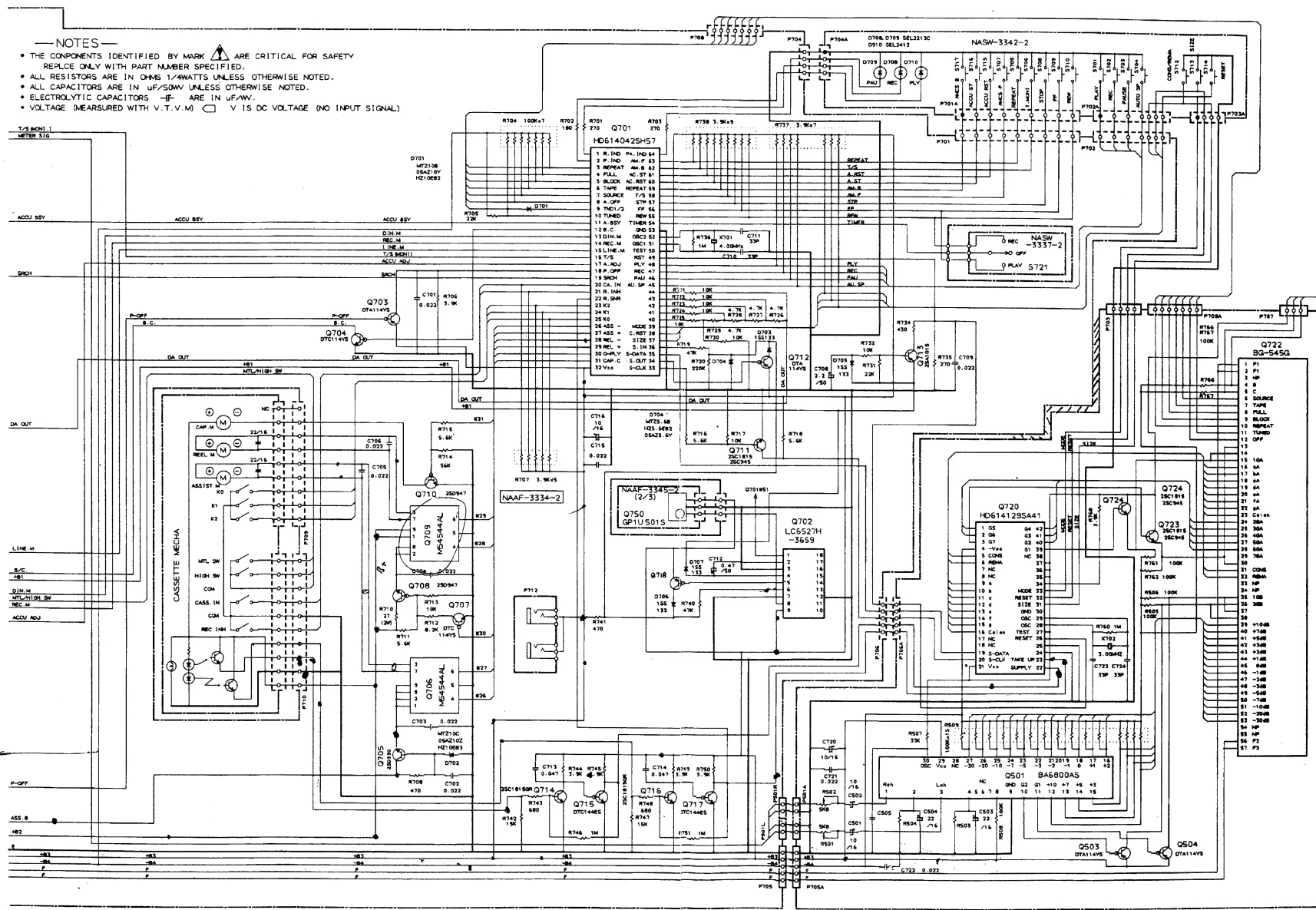
NOTE (D): Only 120V model  
 (G): Only 220V model  
 (W): Only Worldwide model  
 (PX): Only P.X. model



### SCHEMATIC DIAGRAM (CONTROL SECTION) 2/2

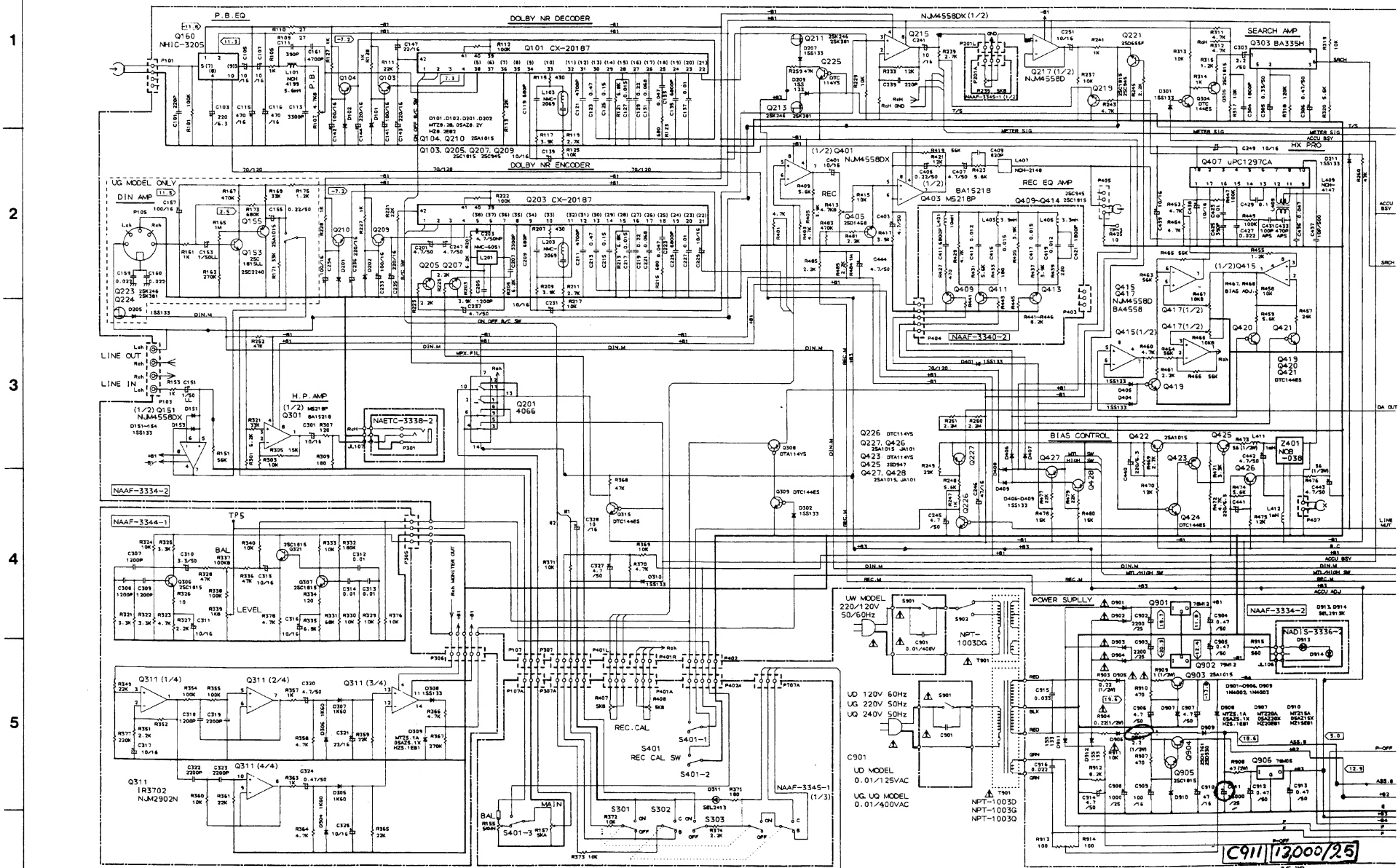
—NOTES—

- THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR SAFETY  
REPLACE ONLY WITH PART NUMBER SPECIFIED.
- ALL RESISTORS ARE IN OHMS 1/4WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN  $\mu\text{F}/50\text{WV}$  UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS  ARE IN  $\mu\text{F}/\text{WV}$ .
- VOLTAGE (MEASURED WITH V.T.V.M)  V IS DC VOLTAGE (NO INPUT SIGNAL)



A C D E F G H

# SCHEMATIC DIAGRAM (AUDIO SECTION) 1/2



A B C D E F G H

TAPE MECHANISM-EXPLODED VIEW

